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| 10/560,819 | 12/15/2005 | Gerard Laslaz | 05165 | 6413 |
| 23338 | 7590 | 03/13/2009 | EXAMINER | |
| DENNISON, SCHULTZ & MACDONALD | | | MORILLO, JANELL COMBS | |
| 1727 KING STREET | | | ART UNIT | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | |
|------------------------------|--------------------------------------|--------------------------------------|
| Office Action Summary | Application No. 10/560,819 | Applicant(s) LASLAZ ET AL. |
| | Examiner Janelle Morillo | Art Unit 1793 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 13 January 2009.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-41 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-14 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on 9/10/2008, 12/3/2008, and 1/13/2009 have been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamamura et al (US 4,163,266) in view of GB 605,282 (GB'282) or US 2,706,680 (Criner) or FR 2,690,927A (FR'927).

Tamamura teaches a cast Al-Si alloy comprising (in wt%):

8-15% Si
1-4% Cu
0.05-0.6% Mg
-0.15% Ni
-0.15% Mn
-0.15% Ti
-0.15% Zr

-0.7% Fe
-0.15% Cr
balance aluminum

(see Tamamura at abstract, column 6 lines 55-59), which overlaps the presently claimed ranges or maximum amounts of Si, Cu, Ni, Mn, Ti, Zr, Fe, Cr, Zn (cl. 1-8), overlaps Mg (cl. 1), touches the boundary of the presently claimed range of Mn (cl. 10), and is a close approximation of the presently claimed range of Mg (cl. 2).

Concerning amended claim 1 as well as claim 9, Tamamura does not teach the addition of V. However, GB'282 teaches that 0.05-0.3% V is added as a grain refiner to Al-Si alloys (page 1 line 47-54). It would have been obvious to one of ordinary skill in the art to add V as a grain refiner to the Al-Si alloy taught by Tamamura, because the prior art teaches V is added for the predictable purpose of grain refinement. Alternatively, Criner teaches that small amounts of V are added to Al casting alloys in order to improve creep properties (column 1 lines 46-51). FR'927 also teaches that Ti, Zr, and V increase creep resistance of Al-Si alloys (abstract). It would have been obvious to one of ordinary skill in the art to have added V to the Al-Si alloy taught by Tamamura, because the prior art teaches V is added for the predictable purpose of improving creep resistance.

Further concerning amended claim 1, Tamamura teaches solution heat treating at 420-450°C and aging at column 3 lines 47-50. Substantially the same dispersion phases are expected to form for the alloy of Tamamura processed by an identical heat treatment, as for the instant invention (such as metastable Cu phases, etc.). Concerning claims 13 and 14, Tamamura does not mention the claimed product by process limitations. However, it would have been within the level of one of ordinary skill in the art to perform a step of solution heat treating the alloy of

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Tamamura at a temperature high enough to provide solid solution of the given Al-Si alloy (the purpose of solution heat treatment), as well as quenching in a medium/at a cooling rate sufficient to maintain the solid solution (the purpose of quenching). Therefore, the product by process limitations of instant claims 13 and 14 are held to be within the disclosure of Tamamura.

Alternatively, see discussion of product by process limitations below.

Tamamura does not teach processing said alloy by the amended feature of "mold" casting, but teaches continuous casting in the examples.

However, with regard to the process steps, it is well settled that a product-by-process claim defines a product, and that when the prior art discloses a product substantially the same as that being claimed, differing only in the manner by which it is made, the burden falls to applicant to show that any process steps associated therewith result in a product materially different from that disclosed in the prior art. See MPEP 2113, *In re Brown* (173 USPQ 685) and *In re Fessman* (180 USPQ 524) *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292. In the instant case, applicant has not shown the instant product by process is materially different than that taught by the prior art of Tamamura combined with FR'927, Criner, or GB'282.

Because the combination of Tamamura with FR'927, Criner, or GB'282 teaches an overlapping/close approximation of the presently claimed alloying ranges, then substantially the same 'high creep resistance' is expected, as for the claimed alloy.

The examiner asserts that where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims (such as creep resistance) are necessarily present. Additionally, the examiner points out the term 'high creep resistance' is a relative term, and the alloy taught by the prior art is held to meet the scope of 'high' by virtue of substantially the same claimed composition. Though Tamamura does not teach mold casting *per se*, Tamamura does teach a process of continuously casting (with a mold/substrate), which meets said casting limitation (see below discussion of wrought vs. foundry

products). Applicant has not shown the instant product by process is materially different from the product by process taught by the prior art.

Overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05. It would have been obvious to one of ordinary skill in the art to select any portion of the range, including the claimed range, from the broader range disclosed in the prior art, because the prior art finds that said composition in the entire disclosed range has a suitable utility.

Additionally, "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages." In re Peterson, 65 USPQ2d at 1379 (CAFC 2003).

Because the combination of Tamamura with FR'927, Criner, or GB'282 teaches an Al-Si alloy that overlaps or touches the boundary of the presently claimed alloying ranges, it is held that Tamamura combined with FR'927, Criner, or GB'282 has created a prima facie case of obviousness of the presently claimed invention.

Concerning claims 11 and 12, though Tamamura does not specify forming said alloy into an insert for a hot part (cl. 11) or a cylinder head (cl. 12). It would have been obvious to one of ordinary skill in the art to have formed the Al-Si alloy taught by Tamamura into an insert for a hot part (cl. 11) or a cylinder head (cl. 12), because Tamamura teaches said Al-Si alloy has excellent wear resistance (examples).

4. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over FR 2,690,927 (FR'927) and further in view of Criner (US 2,706,680) or GB 605,282 (GB'282). FR'927 teaches a Al-Si alloy with 4-23% Si, 0.3-4.5% Cu, 0.1-0.2% Ti, 0.1-0.2% Zr, 0.2-0.4% V, balance aluminum which overlaps the ranges of Si, Mg, Cu, Ni, Ti, Zr, Fe, Zn, V in instant claims 1-9. FR'927 does not teach the addition of Mn (cl. 1, 10) or one of Hf, Nb, Ta, Cr, Mo and/or W (cl. 1). However, Criner teaches the addition of Mn, V, and Zr increase the creep resistance of aluminum alloys (column 1 lines 53-55). Further, Criner teaches the addition of 0.01-0.25% Mo, W, Cr, Ti, Ta, Nb lead to a finer grain size and enhance characteristics of cast

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alloys (column 2 lines 13-17). It would have been obvious to one of ordinary skill in the art to add Mn and one of Mo, W, Cr, Ti, Ta, Nb as taught by Criner to the Al-Si alloy of FR'927,

because Criner teaches said additions lead to better creep resistance and finer grain size.

Alternatively, GB'282 teaches the addition of 0.1-1.5% Mn together with 0.05-1.5% Cr leads to increased ductility while maintaining strength for Al-Si casting alloys, and excellent long wearing properties (page 1, lines 44-45). It would have been obvious to one of ordinary skill in the art to add Mn and Cr to the Al-Si alloy of FR'927, because GB'282 teaches said additions lead to increased ductility while maintaining strength for Al-Si casting alloys.

Overlapping ranges have been held to be a *prima facie* case of obviousness, see MPEP § 2144.05. It would have been obvious to one of ordinary skill in the art to select any portion of the range, including the claimed range, from the broader range disclosed in the prior art, because the prior art finds that said composition in the entire disclosed range has a suitable utility. Additionally, "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages," In re Peterson, 65 USPQ2d at 1379 (CAFC 2003).

Concerning amended claim 1 as well as claim 9, FR'927 does not specify (in the translated parts) solution heat treating or aging. However, it would have been obvious to one of ordinary skill in the art, given the disclosure of FR'927 to perform a heat treatment to optimize strength characteristics (such as a T6 heat treatment), for the predictable purpose of forming solid solution, quenching, and forming hardening precipitates that strengthen the Al-Si alloy. Further, substantially the same dispersion phases are expected to form for the alloy of FR'927 processed by the above heat treatment, as for the instant invention (such as metastable Cu phases, etc.).

FR'927 does not teach processing said alloy by the amended feature of “mold” casting (in the translated parts), but teaches said Al-Si alloy is foundry cast, and used to form cylinder heads and cylinders (abstract). It would have been within the level of one of ordinary skill in the art, given the disclosure of FR'927, to cast with a casting method such as sand casting, mold casting, die casting, which are held to be suitable equivalent foundry casting methods.

Concerning claims 11 and 12, FR'927 teaches said Al-Si alloy is foundry cast, and used to form cylinder heads and cylinders (abstract).

Concerning claims 13 and 14, FR'927 does not mention the claimed product by process limitations. However, it would have been within the level of one of ordinary skill in the art to perform a step of solution heat treating the alloy of FR'927 at a temperature high enough to provide solid solution of the given Al-Si alloy (the purpose of solution heat treatment), as well as quenching in a medium/at a cooling rate sufficient to maintain the solid solution (the purpose of quenching). Therefore, the product by process limitations of instant claims 13 and 14 are held to be within the disclosure of FR'927. Alternatively, see discussion of product by process limitations above.

Response to Amendment/Arguments

5. In the response filed on February 27, 2008 applicant amended claims 1-12, and submitted various arguments traversing the rejections of record. The examiner agrees that no new matter has been added.

6. The declarations under 37 CFR 1.132 filed 1/13/2009 are insufficient to overcome the rejection of claims 1-12 based upon Tamamura as set forth in the last Office action because: a)

there is no evidence between prior art's Al-Si alloy and evidence that V is not an effective grain refiner, b) it is known that V improves creep resistance, and therefore said results are not clearly unexpected (see above rejections), c) declarant's evidence is not commensurate in scope with the presently claimed invention.

7. Further concerning c), it is unclear that an example with 5% Si, 0.10% Fe, 3.75% Cu, 0.10% Mn, <0.01% Mg, 0.13% Zr, 0.27% V, 0.13% Ti is fully representative of the claimed invention with 4.5-10% Si, <0.9% Fe, 2.0-5.0% Cu, 0.1-0.5% Mn, <0.1% Mg, 0.05-0.25% Zr, 0.04-0.30% V, 0.03-0.25% Ti, and 0.03-0.30% Hf, Nb, Ta, Cr, Mo and/or W (cl. 1) (NONE OF Hf, Nb, Ta, Cr, Mo or W are even contained in said example). The examiner suggests applicants do all or at least some of the following: a) submit more evidence to be commensurate in scope/create a clear nexus between the evidence and the instant claims and/or b) amend the instant claims to create said nexus between the evidence and the claim language, and/or c) submit an explanation of why the number and variety of compositions covered by the instant claim language would be expected to behave in a manner consistent with the tested composition.

8. Concerning applicant's previous arguments that cast aluminum alloy products are distinctly different from wrought aluminum alloy products, the examiner acknowledges that wrought alloys (initially ingot cast, then deformed by working, grain structure typically deformed/elongated) and foundry/cast alloys (typically cast into intricate shapes by die casting, mold casting, sand casting, etc. and maintains substantially equiaxed grain structure) have developed a separate status in the art (see aluminum association designations for commercial wrought or cast aluminum alloys). However, the presently stated claims do not clearly define the instant alloy over the cast and subsequently worked alloys of the prior art (i.e. the instant claims

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do not state a microstructure, or other quality to clearly define/distinguish the product by process). As stated above, Tamamura teaches said alloy is continuously cast (column 3 lines 40-41), and further processed by plastic working. The instant claims are drawn to casting in a mold. Though Tamamura does not teach mold casting per se, Tamamura does teach a process of continuous casting (with a mold/ substrate), which meets said casting limitation. Alternatively, applicant has not shown the instant product by process is materially different than that taught by the prior art of record.

Once a reference teaching product appearing to be substantially identical is made the basis of a rejection, and the examiner presents evidence or reasoning tending to show inherency, the burden shifts to the applicant to show an unobvious difference. "[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO's inability to manufacture products or to obtain and compare prior art products." *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)), see MPEP 2112. Applicant has not clearly shown an unobvious difference between the instant invention and the prior art's product.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janelle Morillo whose telephone number is (571) 272-1240. The examiner can normally be reached on 7:30 am- 4:00 pm Mon-Wed.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art Unit
1793

/J. M./
Examiner, Art Unit 1793
March 3, 2009